DISCUSSION OF THE AMENDMENT

The specification has been amended by inserting appropriate headings.

Claim 1 has been amended by incorporating part of Claim 2 therein with regard to coat (E), and by reciting coating system (F) and optional coat (E) as a topcoat, as supported in the specification at page 33, lines 21-22; by inserting an impact strength for the substrate, and by reciting the substrate as substrate 1(A), as supported in the specification at page 2, lines 43-44; and by inserting a value for a ratio (V), as supported in the specification at page 33, lines 18-27. Claim 2 has been amended to be consistent with the amendment to Claim 1, and by deleting "optionally.". Claim 8 has been amended to refer to the claimed substrate as substrate 3, to distinguish it from the substrates that are part of the multicoat system of Claim 1. Claim 9 has been amended to depend on Claim 1. Claims 10-15 have been canceled.

New Claims 20-24 have been added. Claim 20 is supported by Claims 10, 12, and 14. Claim 21 is supported in the specification at the paragraph bridging pages 6 and 7. Claim 22 is supported in the specification at, for example, page 30, lines 26-30. Claim 23 is supported in the specification at page 33, lines 29-30. Finally, Claim 24 is supported by the Examples.

No new matter is believed to have been added by the above amendment. Claims 1-9 and 16-24 are now pending in the application.

REMARKS

The rejections of:

Claims 1-6 and 8-19 under 35 U.S.C. § 102(b) as anticipated by U.S. 4,404,257 (Olson), and

of Claims 1, 2, 5-15 and 17-19 under 35 U.S.C. § 103(a) as unpatentable over U.S. 6,355,345 (Furuya et al) in view of U.S. 4,064,094 (Downey),

are respectfully traversed.

The present invention relates to highly scratch-resistant, radiation-curable coating systems having improved fracture-mechanical properties. As described in the specification beginning at page 1, line 10, high scratch resistance is a widespread requirement of coatings and in the case of hard coatings, a problem frequently arises wherein a microcrack initiated in the coating propagates with a very high degree of local definition through the coating into the substrate to which the coating material is applied. The prior art has sought to address this problem, but the solutions have not been fully satisfactory. The present invention is directed to this particular problem, the object of which is to develop a coating which has very high scratch resistance with good adhesion to the substrate at the same time as reduced crack propagation into the substrate.

As recited in above-amended Claim 1, the present invention is a multicoat system, on a substrate 1 (A), comprising at least one radiation-curable coating system (F), optionally, at least one coat (E), which is pigmented and/or provided with effect substances, and which is adjacent to and under (F), said coating system (F) and optional coat (E) being a topcoat, and at least one elastic intercoat (D), which is located between the substrate and the topcoat, and has a glass transition temperature (T_g) of -20°C or less (measured in the frequency range up to 1000 Hz), wherein the substrate has an impact strength to DIN EN ISO 179/1fU at 23°C and 50% humidity of at least 20 kJ/m^2, and the ratio (V) of the intercoat thickness (ZS) to the

total thickness of the intercoat and the topcoat (DL), expressed as V = ZS/(ZS + DL), is at least 0.05 at a temperature of at least 25°C.

The applied prior art neither recognizes the particular problem faced by Applicants, nor Applicants' solution thereto.

Olson discloses a coated polycarbonate article, wherein surface layers are impregnated with an ultraviolet radiation absorbing compound and a coating comprised of a thermoplastic acrylic polymer containing primer layer, and a top coat disposed on the primer layer containing a colloidal silica filled thermoset organopolysiloxane, is deposited on the impregnated surface (Abstract). The Examiner finds that the thermoplastic acrylic polymers disclosed by Olson "are known in the art to have a glass transition temperature of less than -20°C."

In reply, some thermoplastic acrylic polymers have such a glass transition temperature; some do not. Indeed, it is well-known that the glass transition temperature (T_g) of a polymer can be calculated by the well-known Fox equation, wherein T_g is a function of individual T_gs of homopolymers of particular monomer(s) making up the polymer, and the mass fraction of each of the monomer(s) in the polymer. See, for example, the paragraph bridging columns 1 and 2 in U.S. 6,969,734 (Pressley et al), a copy of which is **enclosed herewith**. Indeed, as described in the specification herein at page 11, lines 15-17, polyacrylates of the specified T_g generally contain a high fraction of n-butyl acrylate or 2-ethylhexyl acrylate, preferably at least 50% by weight, although Applicants make no admission that the presently-recited T_g cannot be satisfied with other monomers. Clearly, Olson evinces no recognition of the importance of T_g. In addition, Olson discloses and suggests nothing with regard to his substrate having the presently-recited impact strength, or the presently-recited ratio (V).

Furuya et al discloses a laminate film for preventing glass from shattering, which comprises (A) a biaxially oriented polyester film of a copolyester containing ethylene-2,6-naphthalenedicarboxylate recurring units in an amount of at least 80 mol % of all recurring units, (B) an adhesive coating film on at least one side of the above biaxially oriented polyester film, the adhesive coating film comprising a composition which contains a water-soluble or dispersible polyester having a secondary transition temperature of 40 to 85°C and at least one amide compound selected from the group consisting of fatty acid amide and fatty acid bisamide, (C) a hard coat layer on the above adhesive coating film, with the proviso that when the adhesive coating film is formed on both sides of the biaxially oriented polyester film, the hard coat layer is formed on only one of the adhesive coating films, and (D) an antireflection layer on the above hard coat layer (column 2, lines 1-20). Furuya et al discloses further that when the biaxially oriented polyester film has the adhesive coating film on its both sides, coating of the laminate film to a glass surface may be conducted by providing a pressure sensitive adhesive (PSA) layer onto the adhesive coating film, and when the biaxially oriented polyester film has the adhesive coating film only on one side, the PSA layer is formed on the side on which the adhesive coating film is not formed, whereby the laminate film is coated on glass (column 9, lines 16-24). The Examiner relies on Furuya et al's disclosure of styrene-based block copolymers as applicable PSAs (column 9, line 27ff).

Recognizing that Furuya et al does not disclose a T_g for their PSA, or for their styrene-based block copolymer-based PSAs, the Examiner relies on Downey. Downey discloses a sprayable-pressure sensitive adhesive composition comprising a dispersion of about 30-70 wt.% of a particular thermoplastic hydrocarbon derived resin, and about 70-30 wt.% of a particular styrene-isoprene-styrene unvulcanized elastomeric block copolymer, wherein in the block copolymer, the styrene blocks have a T_g above 25°C and the isoprene polymer blocks have a T_g below about 10°C (column 1, lines 30-54). The Examiner

particularly relies on Example III therein, wherein the block copolymer, obtainable as Kraton 1107 from Shell Chemical Co., has a T_g of about -70°C. The Examiner finds that it would have been obvious to use this block copolymer as the PSA in Furuya et al, the motivation being that "such PSAs are spray applicable and adhere well to a variety of substrates."

In reply, there is no requirement that Downey's PSA have a T_g of -20°C or less, and it is clear from Downey's definition of their PSA that its T_g can be above -20°C. Nevertheless, the fact that Downey discloses sprayable PSAs does not provide the requisite motivation to use Downey's PSA as the PSA of Furuya et al. Indeed, Furuya et al contain no requirement that their PSA be applied by spraying. Moreover, even if Furuya et al and Downey were combined, the result would not be the presently-claimed invention, because neither Furuya et al nor Downey discloses or suggests a substrate having the presently-recited impact strength, or the presently-recited ratio (V).

For all the above reasons, it is respectfully requested that the rejections over prior art be withdrawn.

The rejection of Claim 8 under 35 U.S.C. § 112, second paragraph, is respectfully traversed. Indeed, the rejection is now moot in view of the above-discussed amendment. Accordingly, it is respectfully requested that the rejection be withdrawn.

The specification has been amended in accordance with the guidelines listed at paragraph 3 of the Office Action.

Finally, while paragraph 2 of the Office Action states that initialed copies of corresponding Form PTO-1449s for Information Disclosure Statements (IDSs) filed July 11, 2005 and January 12, 2005 are enclosed with the Office Action, Applicants note that **no** initialed Form PTO-1449 was enclosed. Applicants note further that only one Form PTO-1449 has been filed, and that was with the IDS filed January 12, 2005. The Examiner is respectfully requested to include the initialed copy with the next Office communication.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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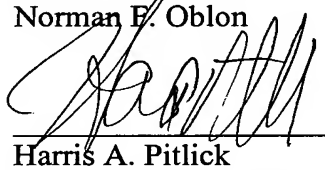

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